Concerning Norcocaine, Ethylbenzoylcegonine, and the Identification of Cocaine Use in Human Hair

To The Editor:

The analysis of drugs of abuse in human hair is the topic of much current research and literature. A major concern is the ability to distinguish between drug use and environmental contamination of hair. A recent article published in the Journal of Analytical Toxicology (1) suggests the use of norcocaine and cocaethylene (ethylbenzoylcegonine) as potential markers for active cocaine use. This suggestion is based on the knowledge that these two compounds are metabolites of cocaine and the assumption that they are either absent in illicit cocaine or present in very low amounts.

An Edmonton case involved cocaine that was smuggled into Canada, dissolved in bottles of liquor, and subsequently extracted and converted to its hydrochloride salt (2). The resulting illicit cocaine contained about 20% ethylbenzoylcegonine relative to the cocaine. Significant amounts of this product were distributed in the Edmonton area over a period of about two years. Although it is novel to see such a large amount of ethylbenzoylcegonine in illicit cocaine, this is probably not a unique occurrence.

A research project detailing a method for comparative analysis of illicit cocaine samples has recently been completed (3). Norcocaine is one of the compounds that was monitored in this work. Over the two years of the data collection, a number of cocaine cases were found to contain norcocaine concentrations as high as 2 to 3% relative to the cocaine. Research would be required to determine if this amount of norcocaine would be significant enough to remain on environmentally exposed hair samples after washing.

The use of norcocaine and ethylbenzoylcegonine as markers of cocaine consumption in hair analysis is probably valid in most instances. However, in light of the above information, I respectfully suggest that some degree of caution is warranted.

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References


The Author Replies:

The usefulness of a chemical analyte as a "marker" for drug use depends upon the relative uniqueness of the analyte to the milieu of chemicals that individuals have been exposed. The respondent has a valid point that if cocaethylene or norcocaine are present in illicit cocaine in sufficient amounts, they cannot serve as markers for cocaine use.

Our present state of knowledge suggests that the occurrence of cocaethylene in cocaine in significant amounts is a relatively rare event. Further, the presence of norcocaine in trace amounts in cocaine is not likely to be detectable in biological samples, except possibly in overdose cases. Current methods of hair analysis for the determination of cocaine use are contingent upon the identification of benzoylcegonine and/or cocaine. Because these substances are widely prevalent in the environment, interpretation of positive findings should include consideration of possible environmental exposure and artifactual production of benzoylcegonine. Clearly, norcocaine and cocaethylene are less prevalent and should serve as markers with greater specificity for cocaine use than the analytes in current use.

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